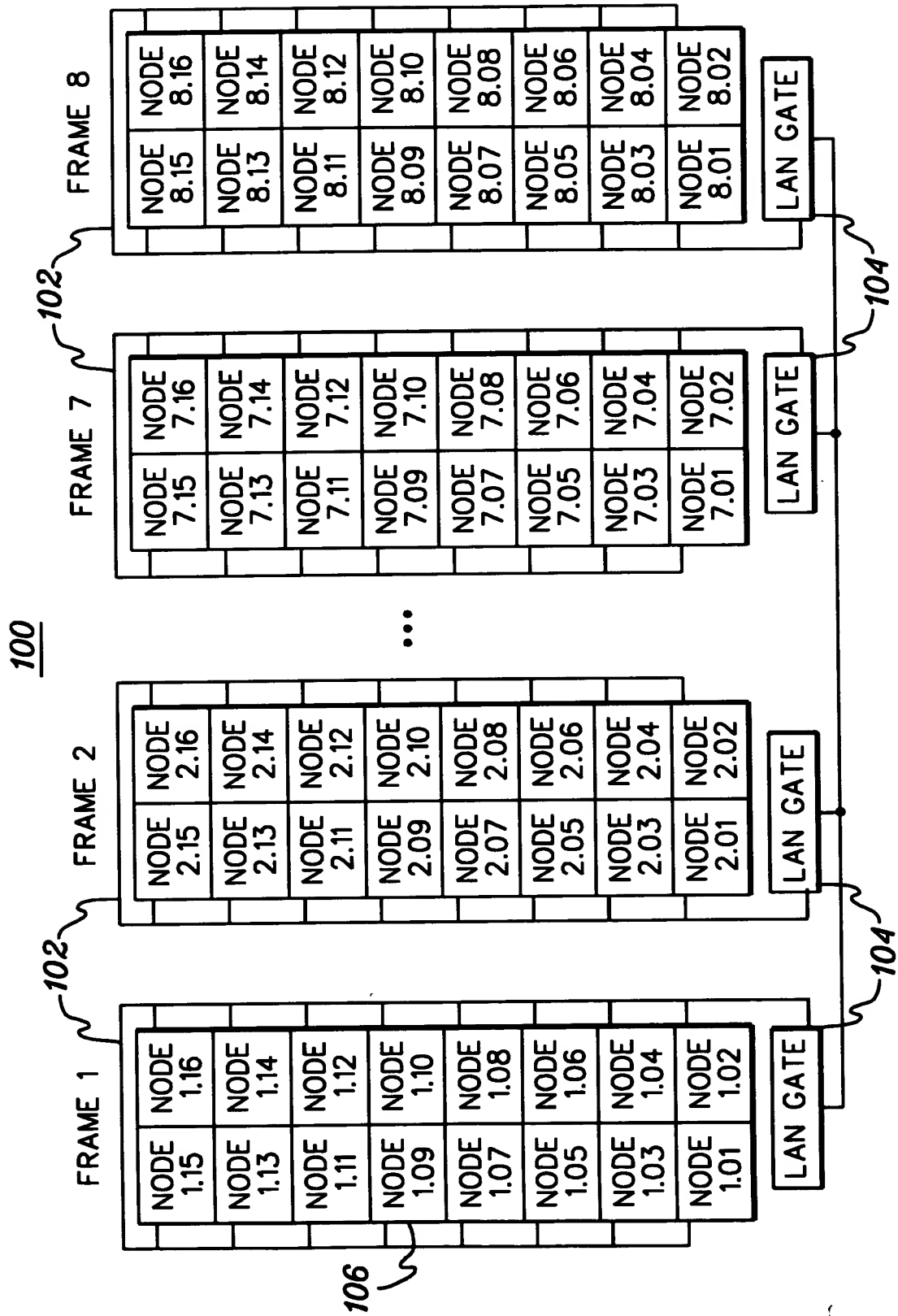
100
FRAME 1
FRAME 2
FRAME 7
FRAME 8
NODE 1.01
NODE 1.02
NODE 1.03
NODE 1.04
NODE 1.05
NODE 1.06
NODE 1.07
NODE 1.08
NODE 1.09
NODE 1.10
NODE 1.11
NODE 1.12
NODE 1.13
NODE 1.14
NODE 1.15
NODE 1.16
NODE 2.01
NODE 2.02
NODE 2.03
NODE 2.04
NODE 2.05
NODE 2.06
NODE 2.07
NODE 2.08
NODE 2.09
NODE 2.10
NODE 2.11
NODE 2.12
NODE 2.13
NODE 2.14
NODE 2.15
NODE 2.16
NODE 7.01
NODE 7.02
NODE 7.03
NODE 7.04
NODE 7.05
NODE 7.06
NODE 7.07
NODE 7.08
NODE 7.09
NODE 7.10
NODE 7.11
NODE 7.12
NODE 7.13
NODE 7.14
NODE 7.15
NODE 7.16
NODE 8.01
NODE 8.02
NODE 8.03
NODE 8.04
NODE 8.05
NODE 8.06
NODE 8.07
NODE 8.08
NODE 8.09
NODE 8.10
NODE 8.11
NODE 8.12
NODE 8.13
NODE 8.14
NODE 8.15
NODE 8.16
LAN GATE
LAN GATE
LAN GATE
LAN GATE
102
102
104
104
106

fig. 1

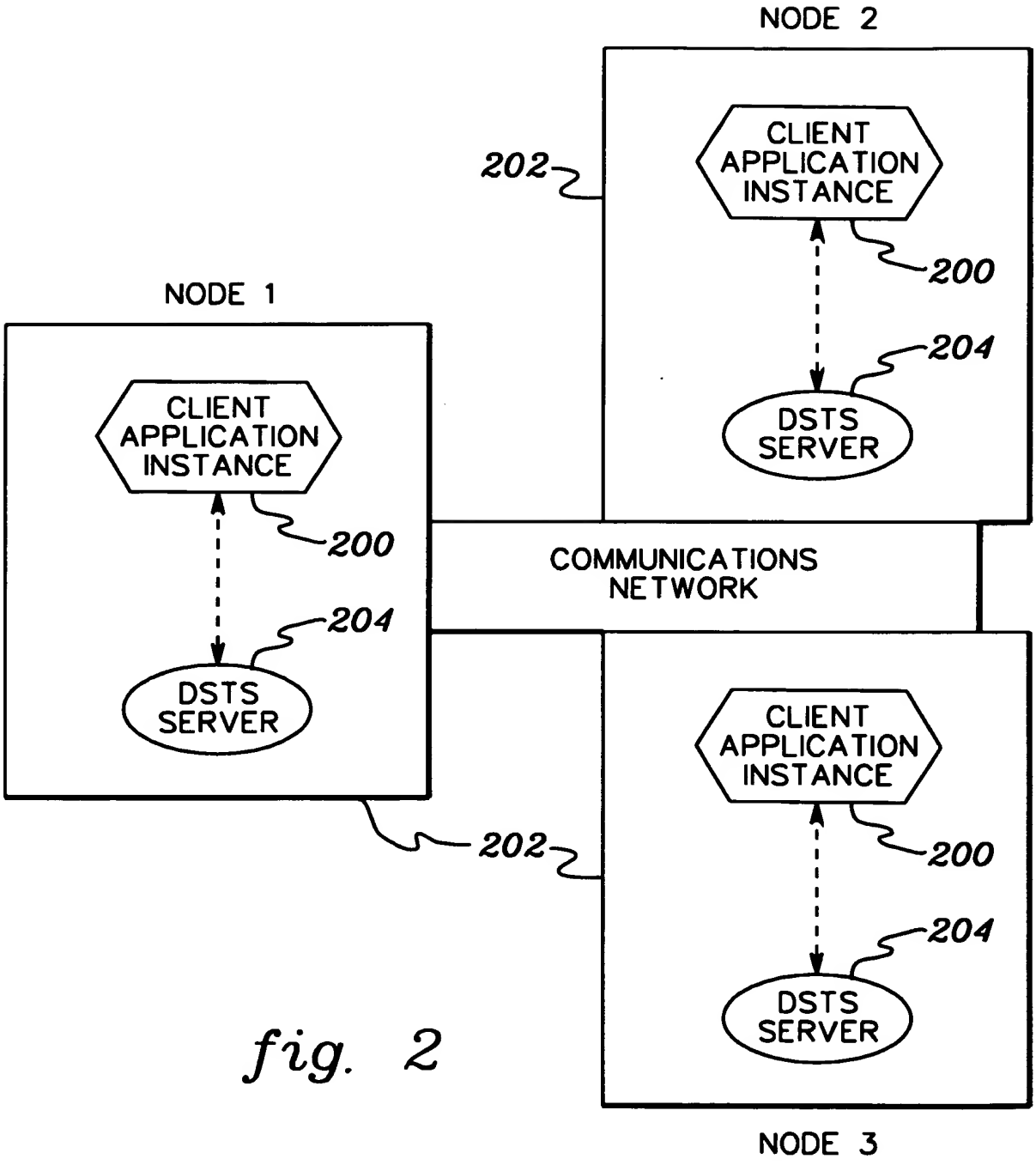
NODE 2
CLIENT APPLICATION INSTANCE
202
200
204
DSTS SERVER
NODE 1
CLIENT APPLICATION INSTANCE
200
204
DSTS SERVER
COMMUNICATIONS NETWORK
202
CLIENT APPLICATION INSTANCE
200
204
DSTS SERVER
NODE 3

fig. 2

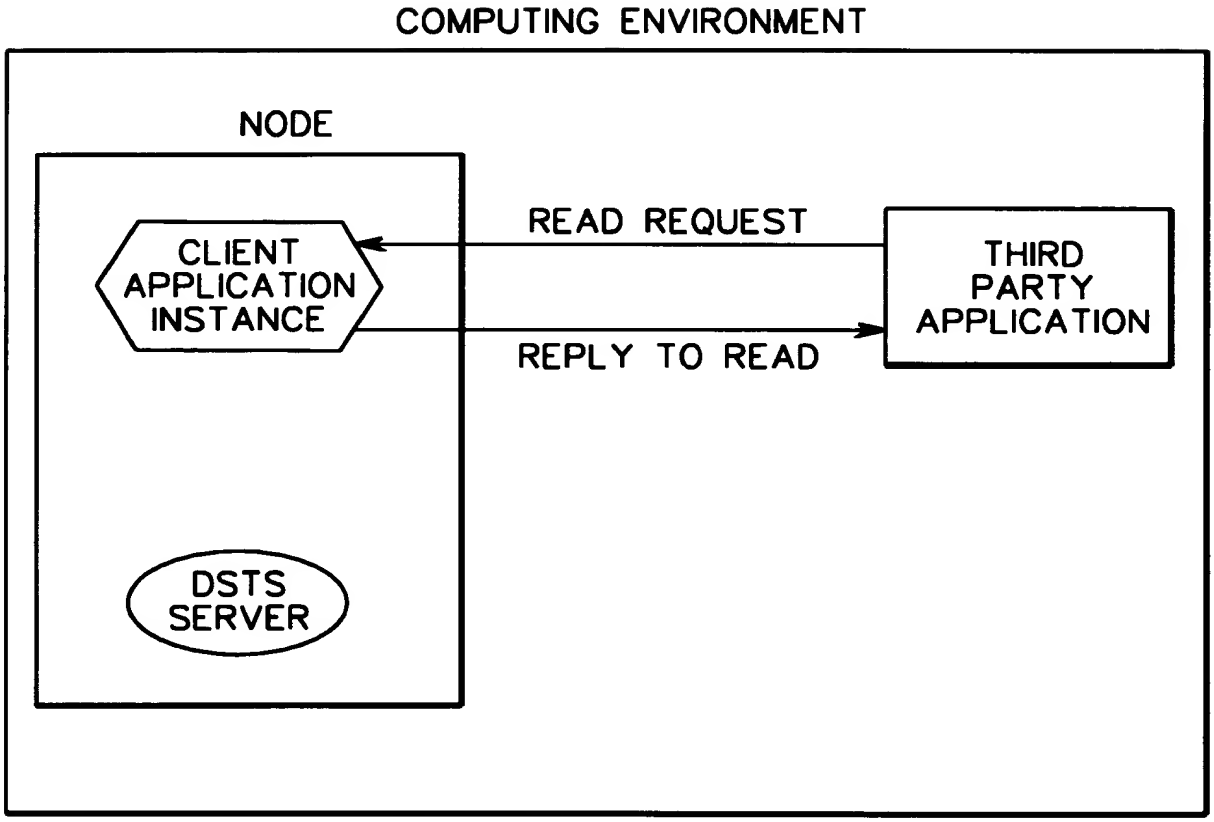
COMPUTING ENVIRONMENT
NODE
CLIENT APPLICATION INSTANCE
READ REQUEST
REPLY TO READ
THIRD PARTY APPLICATION
DSTS SERVER

fig. 3

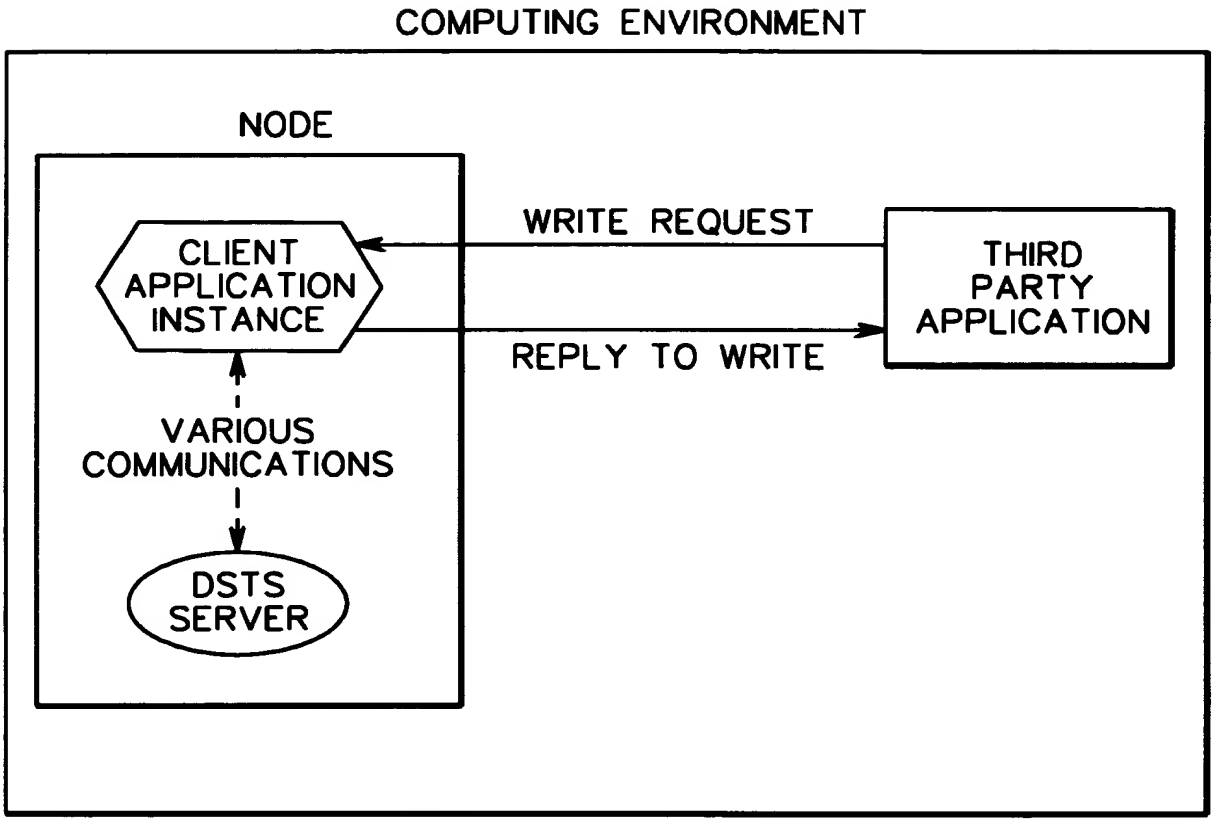
COMPUTING ENVIRONMENT
NODE
CLIENT APPLICATION INSTANCE
WRITE REQUEST
REPLY TO WRITE
THIRD PARTY APPLICATION
VARIOUS COMMUNICATIONS
DSTS SERVER

fig. 4

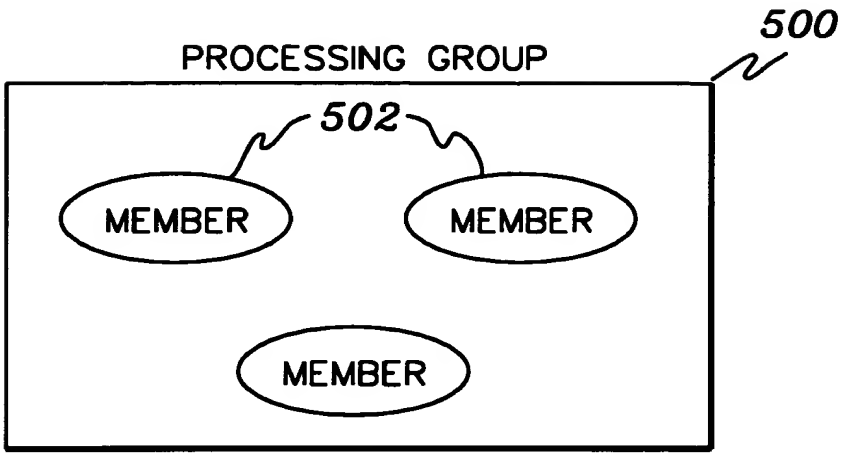
500
PROCESSING GROUP
502
MEMBER
MEMBER
MEMBER

fig. 5

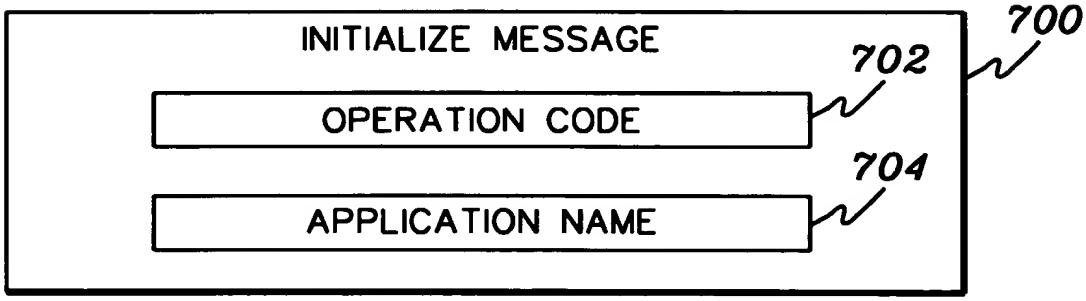
700
INITIALIZE MESSAGE
702
OPERATION CODE
704
APPLICATION NAME

fig. 7

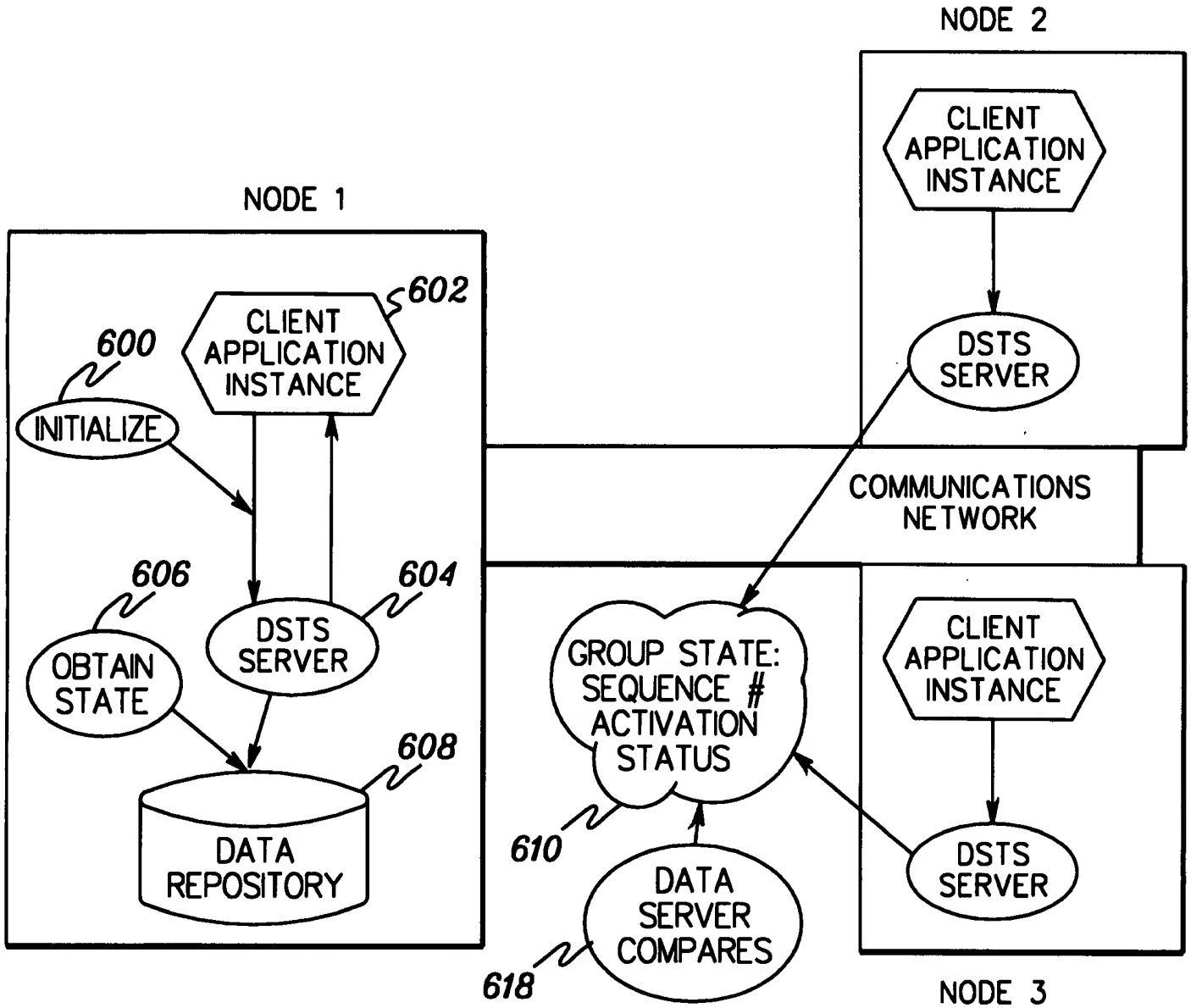
NODE 2
CLIENT APPLICATION INSTANCE
DSTS SERVER
NODE 1
602
CLIENT APPLICATION INSTANCE
600
INITIALIZE
COMMUNICATIONS NETWORK
606
604
DSTS SERVER
OBTAIN STATE
608
DATA REPOSITORY
GROUP STATE: SEQUENCE # ACTIVATION STATUS
CLIENT APPLICATION INSTANCE
610
DSTS SERVER
DATA SERVER COMPARES
618
NODE 3

fig. 6A

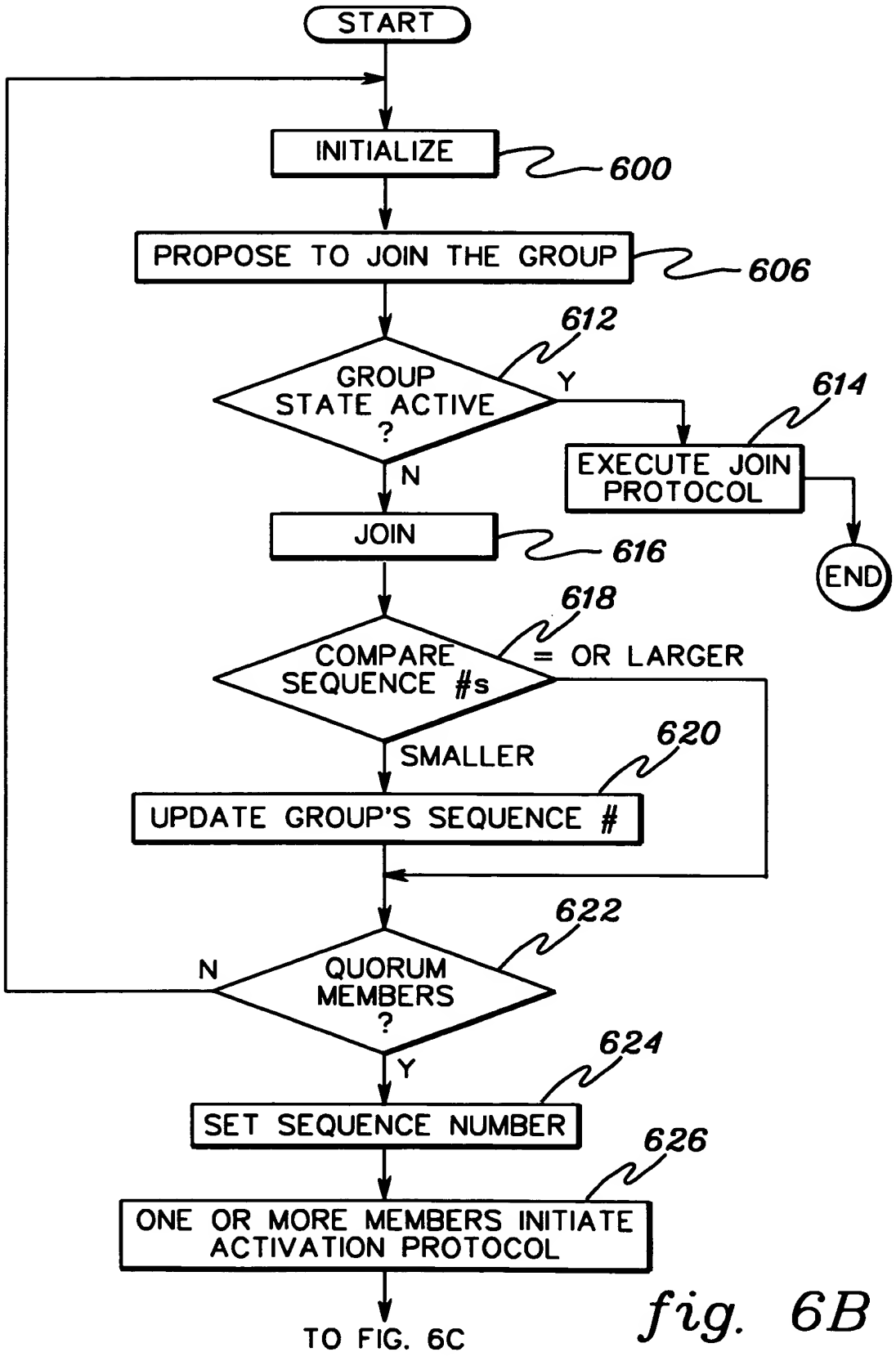
ACTIVATION – INITIALIZATION STEP
START
INITIALIZE
600
PROPOSE TO JOIN THE GROUP
606
612
GROUP STATE ACTIVE ?
Y
614
EXECUTE JOIN PROTOCOL
END
N
JOIN
616
618
COMPARE SEQUENCE #s
= OR LARGER
SMALLER
620
UPDATE GROUP'S SEQUENCE #
622
N
QUORUM MEMBERS ?
Y
624
SET SEQUENCE NUMBER
626
ONE OR MORE MEMBERS INITIATE ACTIVATION PROTOCOL
TO FIG. 6C

fig. 6B

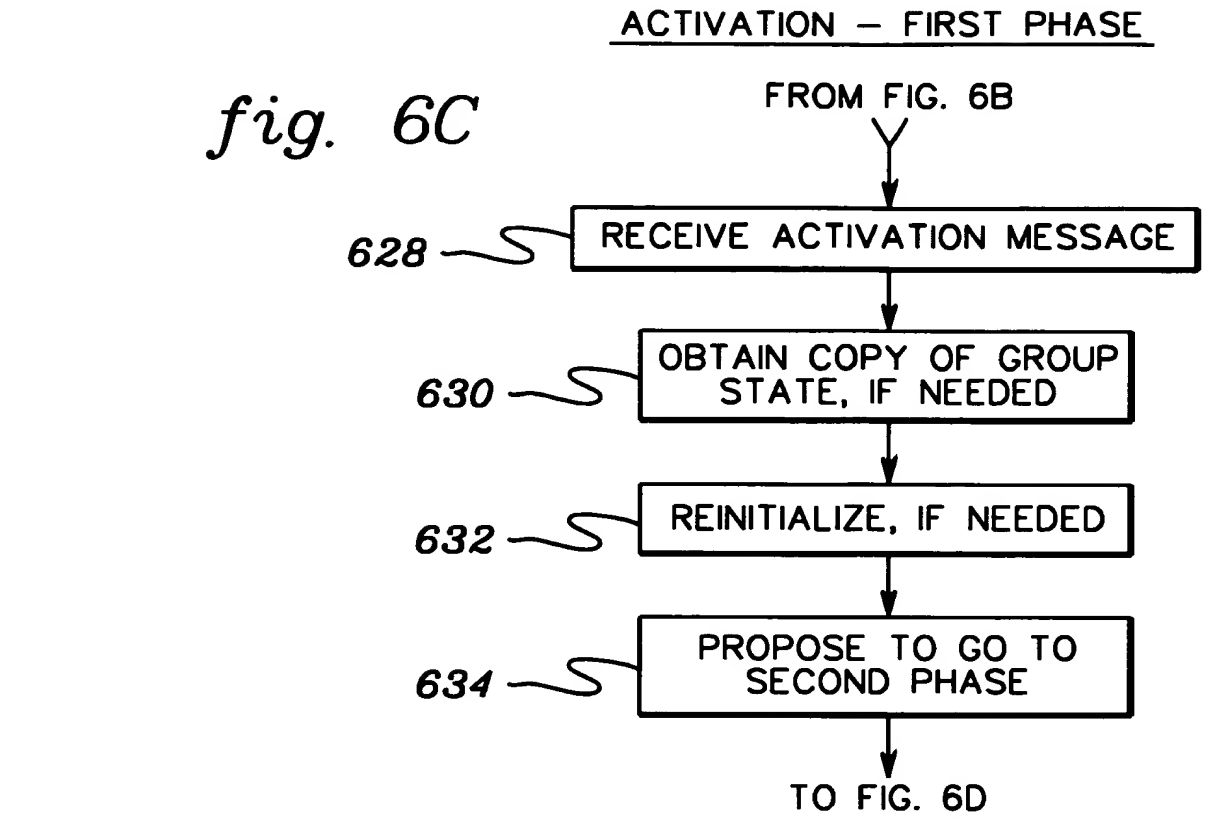

fig. 6C

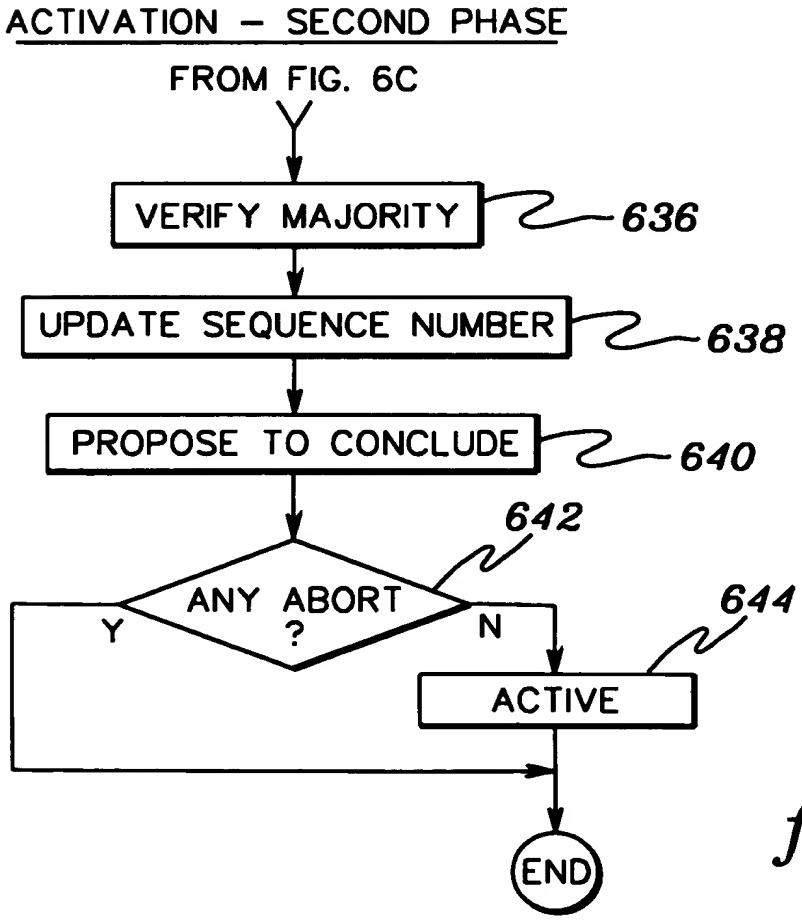

fig. 6D

Document 1 of 1

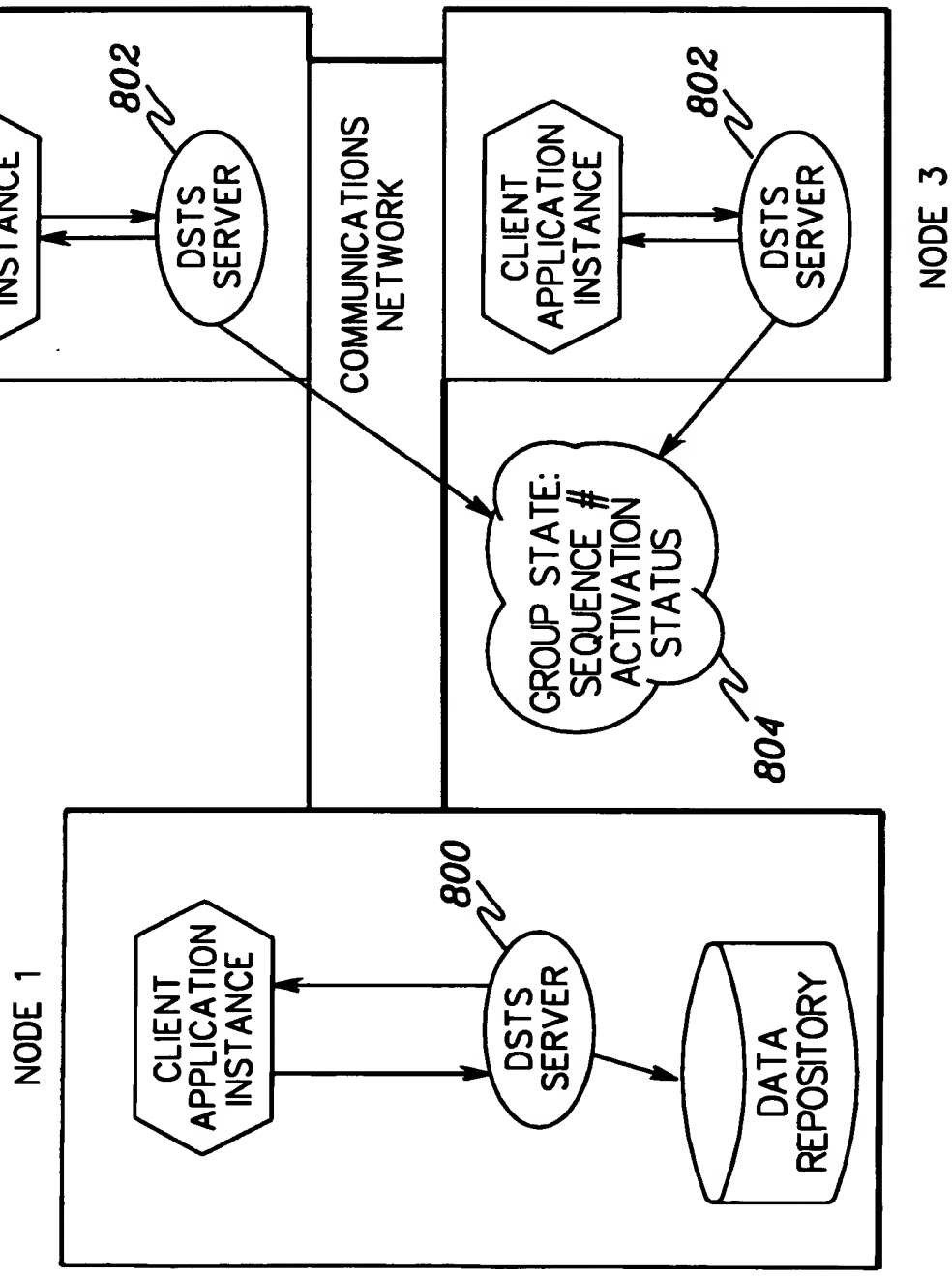
NODE 1
CLIENT APPLICATION INSTANCE
800
DSTS SERVER
DATA REPOSITORY
NODE 2
CLIENT APPLICATION INSTANCE
802
DSTS SERVER
COMMUNICATIONS NETWORK
NODE 3
CLIENT APPLICATION INSTANCE
802
DSTS SERVER
GROUP STATE: SEQUENCE # ACTIVATION STATUS
804

fig. 8

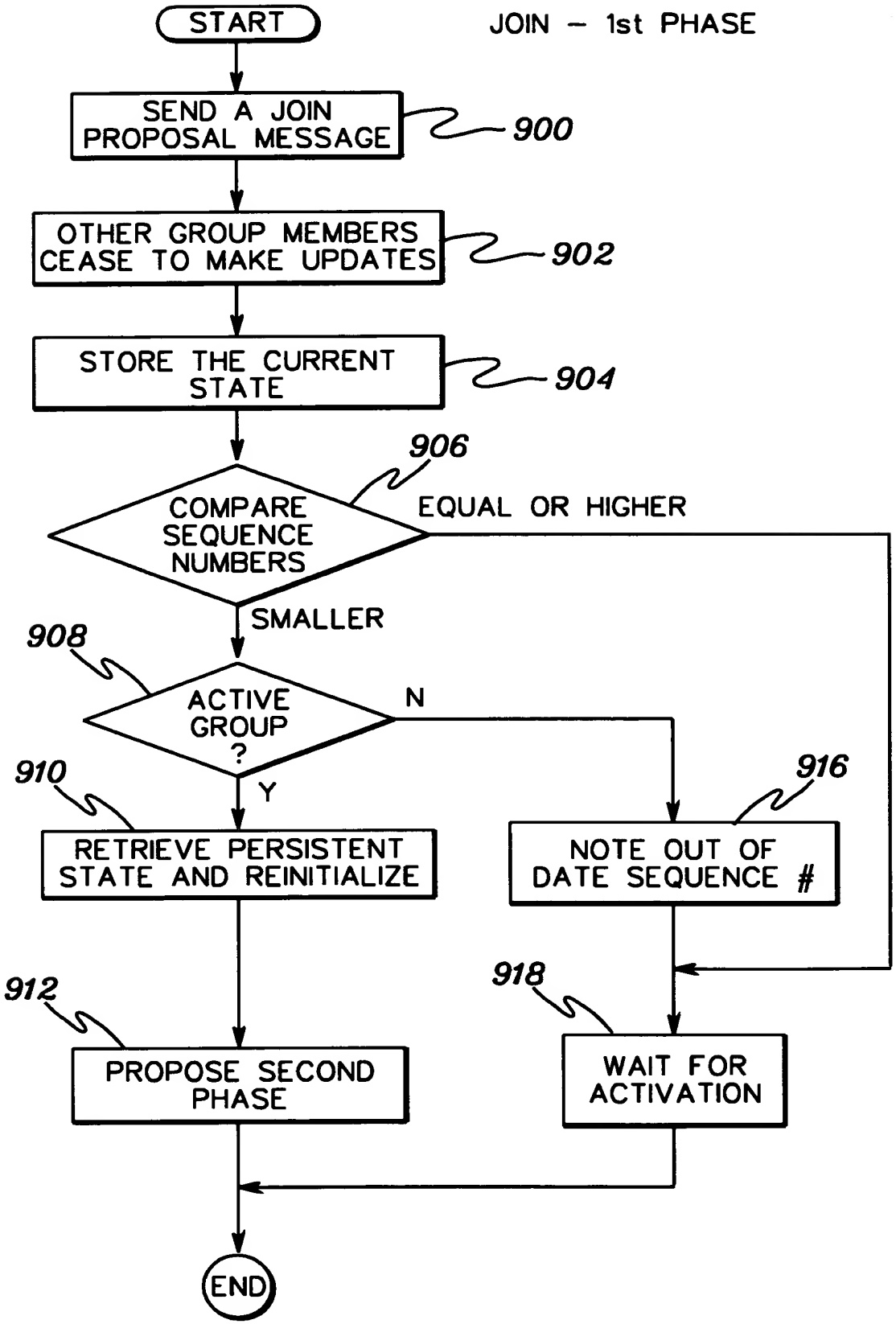
START
JOIN – 1st PHASE
SEND A JOIN PROPOSAL MESSAGE
900
OTHER GROUP MEMBERS CEASE TO MAKE UPDATES
902
STORE THE CURRENT STATE
904
906
COMPARE SEQUENCE NUMBERS
EQUAL OR HIGHER
SMALLER
908
ACTIVE GROUP ?
N
Y
910
RETRIEVE PERSISTENT STATE AND REINITIALIZE
916
NOTE OUT OF DATE SEQUENCE #
912
PROPOSE SECOND PHASE
918
WAIT FOR ACTIVATION
END

fig. 9A

JOIN – 2nd PHASE

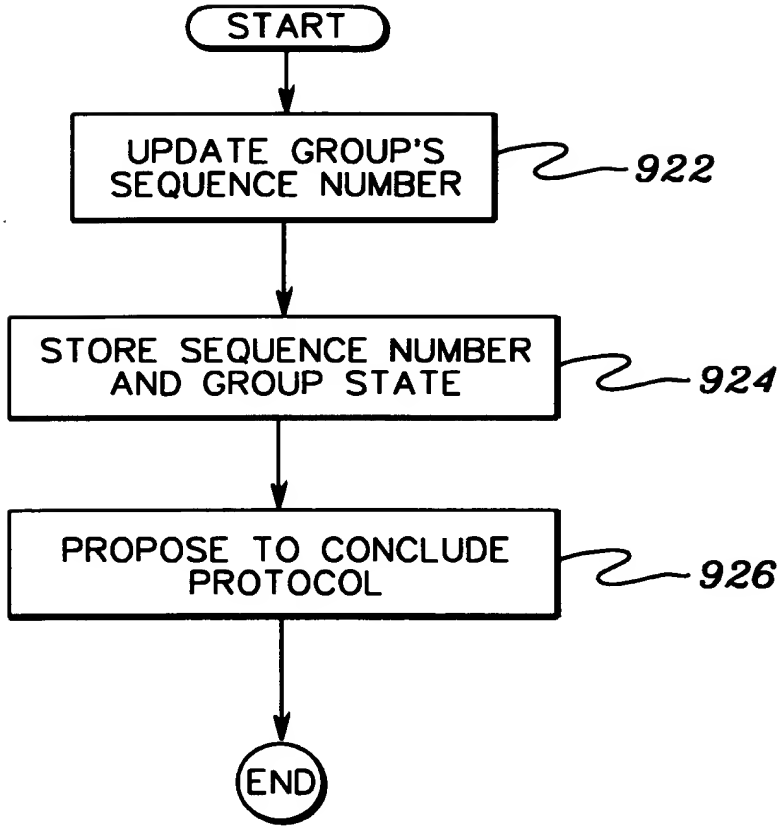

fig. 9B

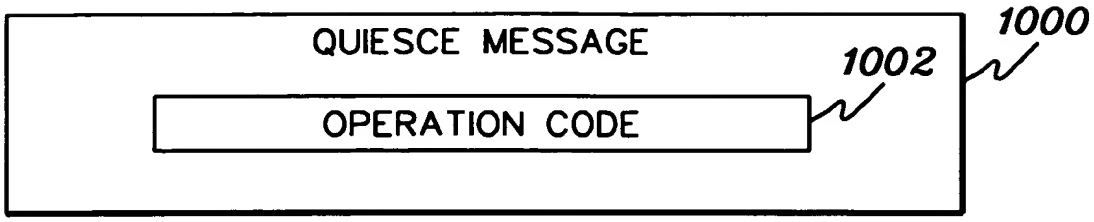

fig. 10

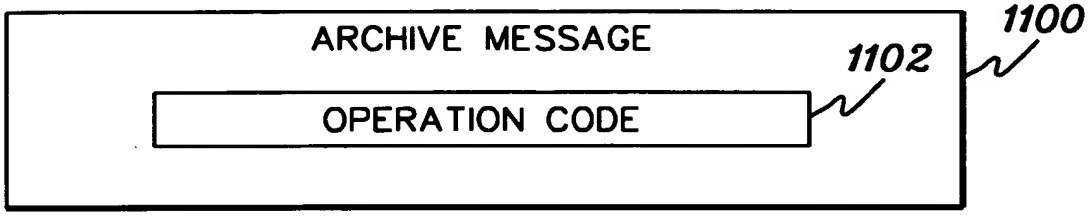

fig. 11

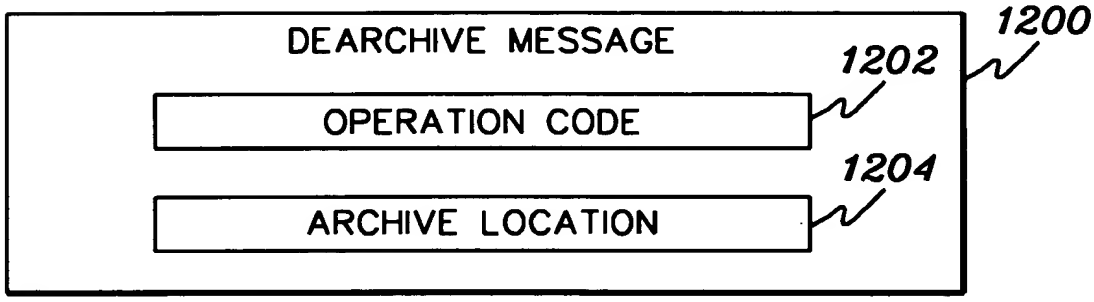

fig. 12

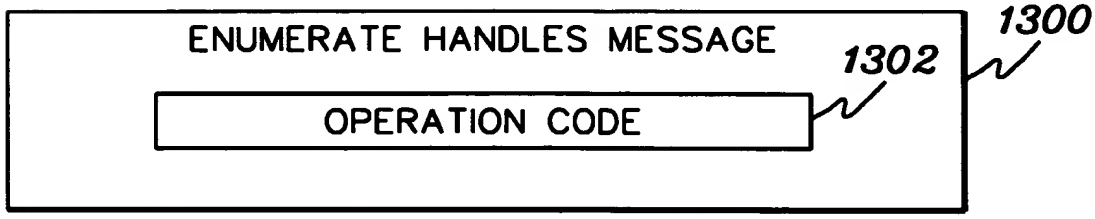

fig. 13

Document 1 of 1

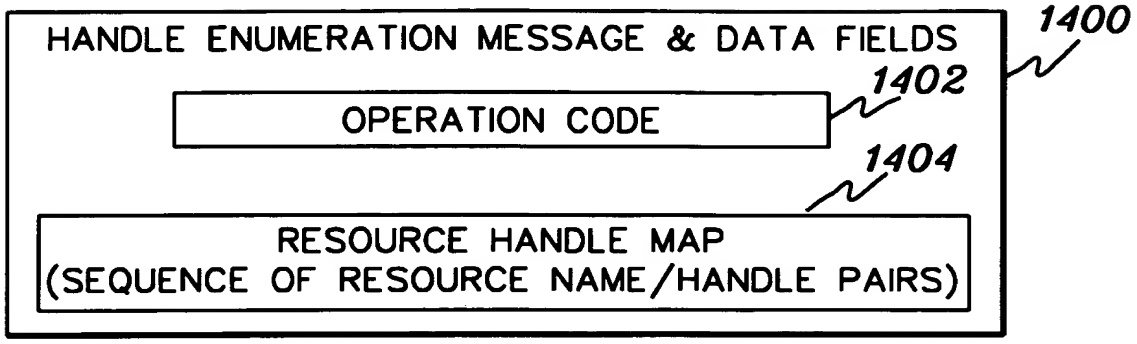

fig. 14

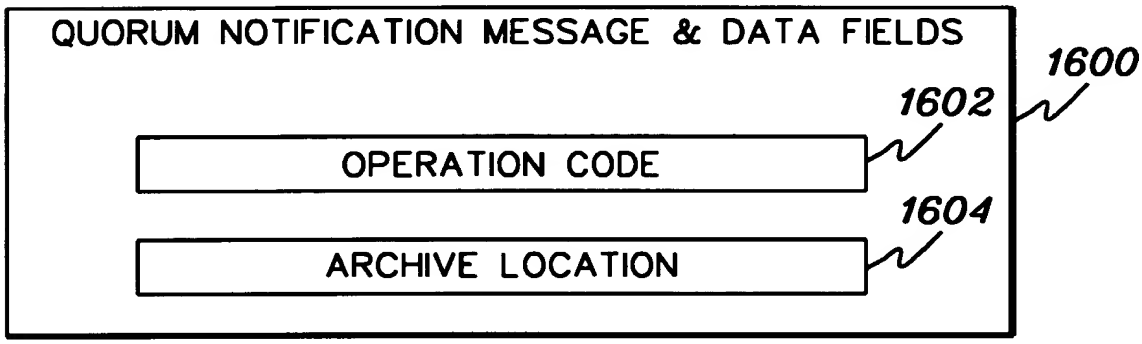

fig. 16

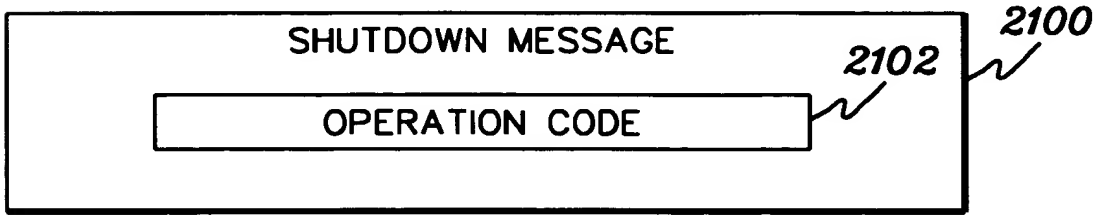

fig. 21

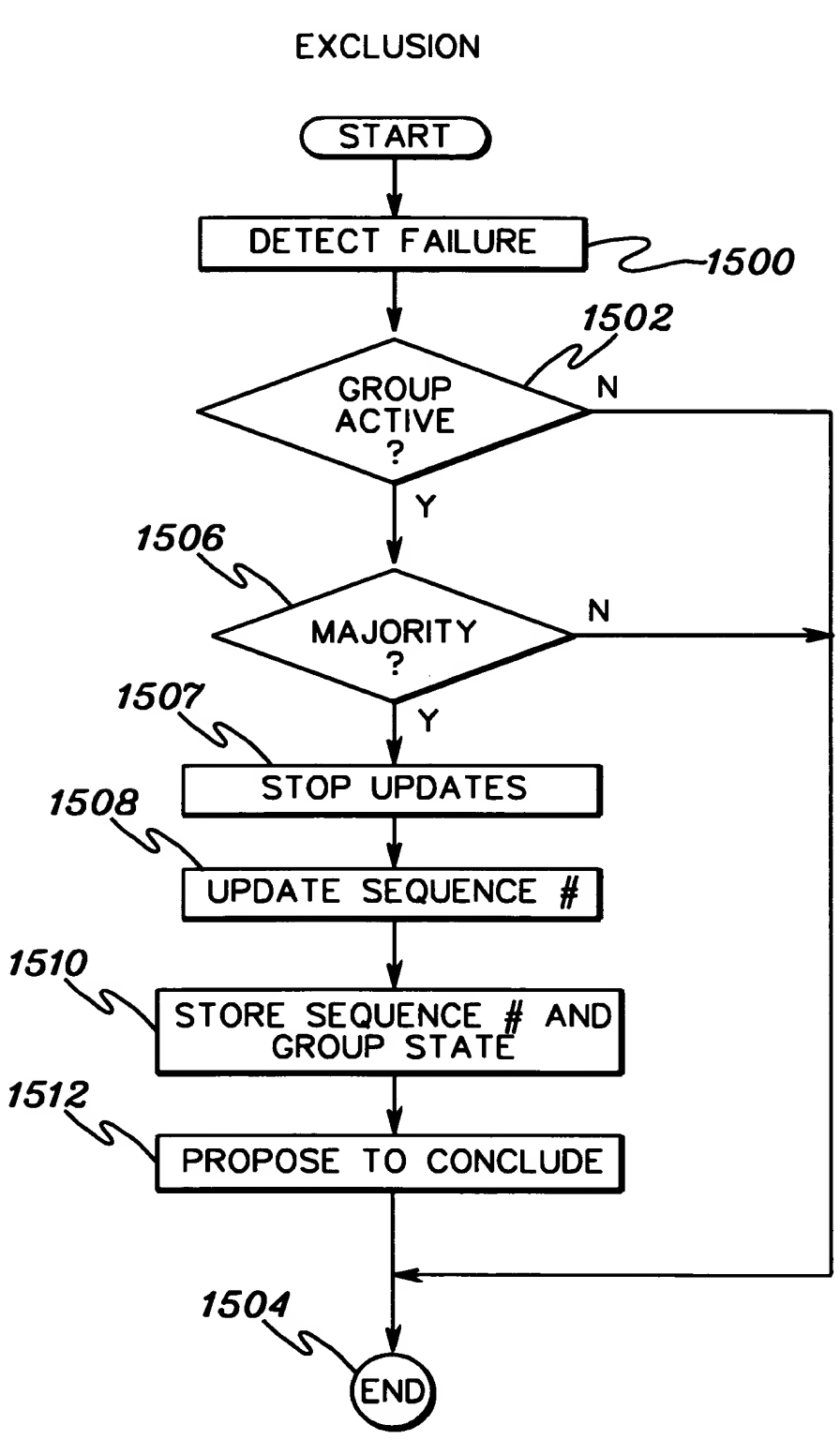
EXCLUSION
START
DETECT FAILURE
1500
1502
GROUP ACTIVE ?
N
Y
1506
MAJORITY ?
N
Y
1507
STOP UPDATES
1508
UPDATE SEQUENCE #
1510
STORE SEQUENCE # AND GROUP STATE
1512
PROPOSE TO CONCLUDE
1504
END

fig. 15

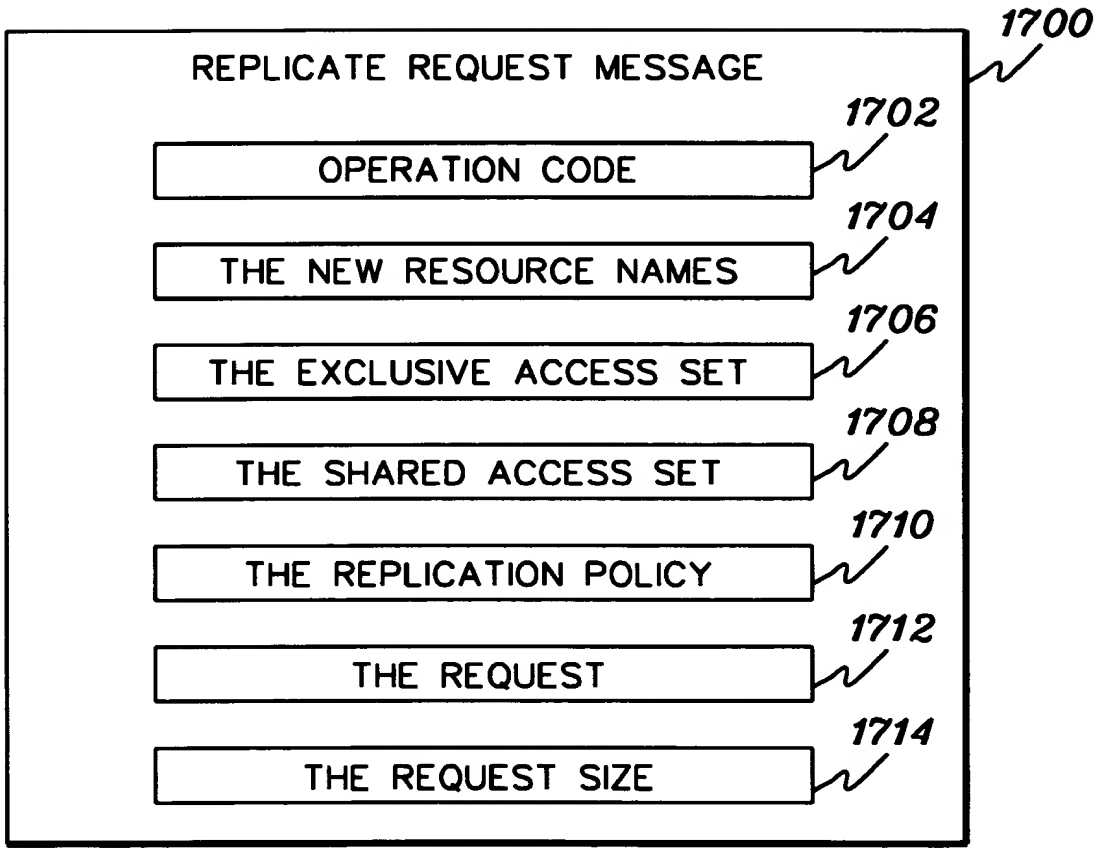
1700
REPLICATE REQUEST MESSAGE
1702
OPERATION CODE
1704
THE NEW RESOURCE NAMES
1706
THE EXCLUSIVE ACCESS SET
1708
THE SHARED ACCESS SET
1710
THE REPLICATION POLICY
1712
THE REQUEST
1714
THE REQUEST SIZE

fig. 17

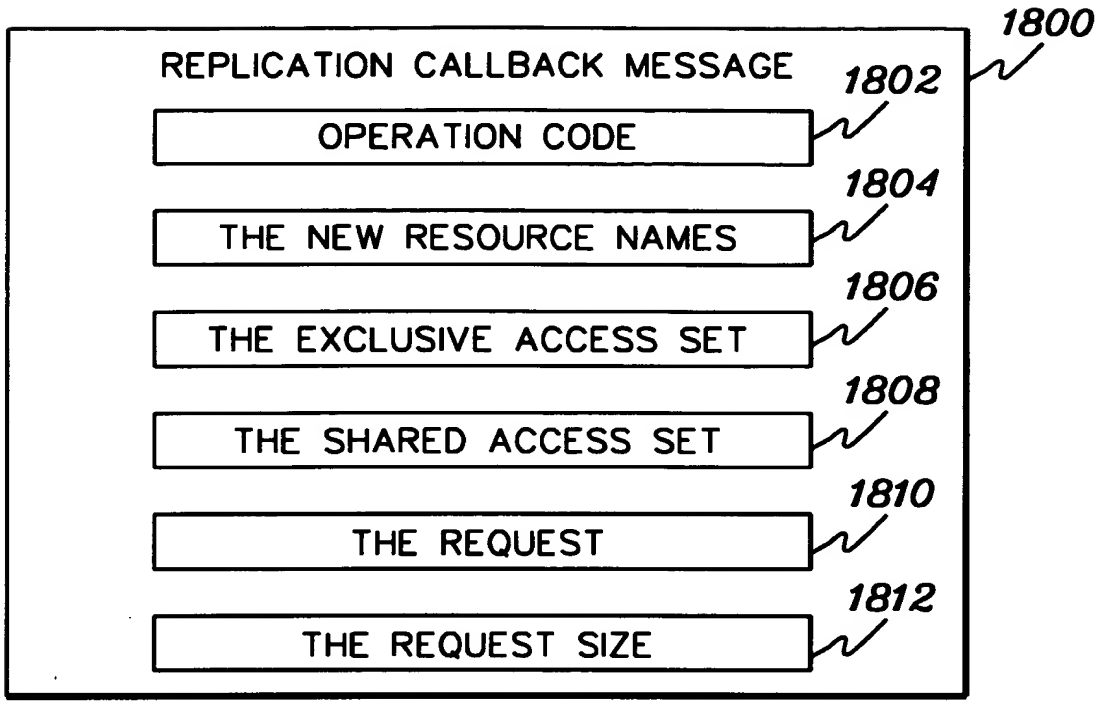

fig. 18

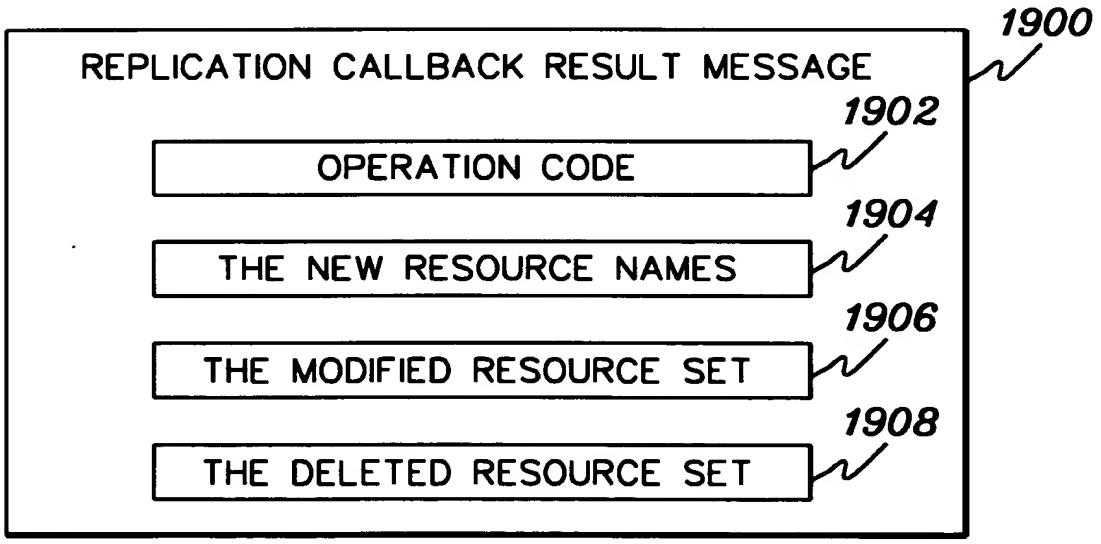

fig. 19

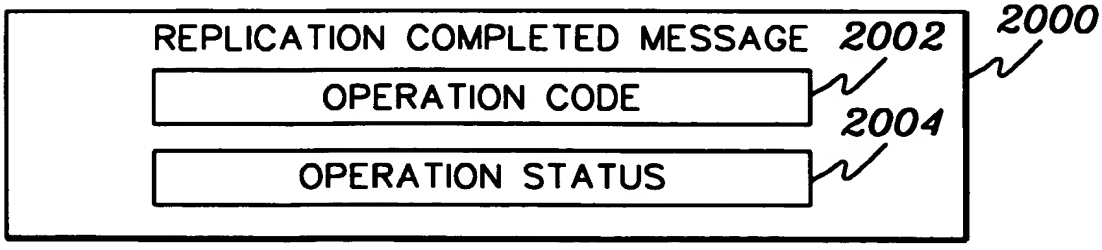

fig. 20

Docket: POU9-2000-0014-US1

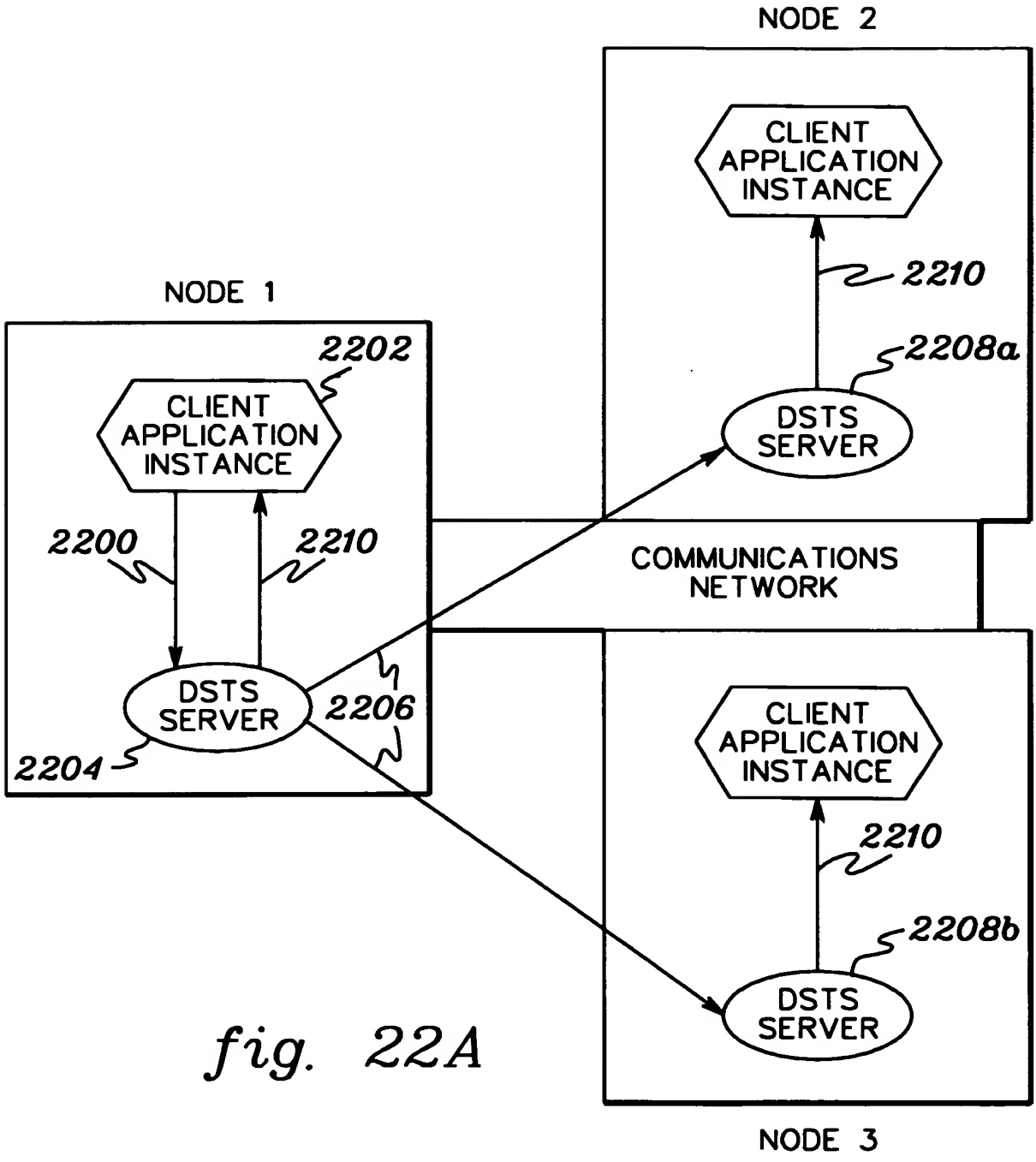
NODE 2
CLIENT APPLICATION INSTANCE
2210
2208a
DSTS SERVER
NODE 1
2202
CLIENT APPLICATION INSTANCE
2200
2210
COMMUNICATIONS NETWORK
DSTS SERVER
2206
2204
CLIENT APPLICATION INSTANCE
2210
2208b
DSTS SERVER
NODE 3

fig. 22A

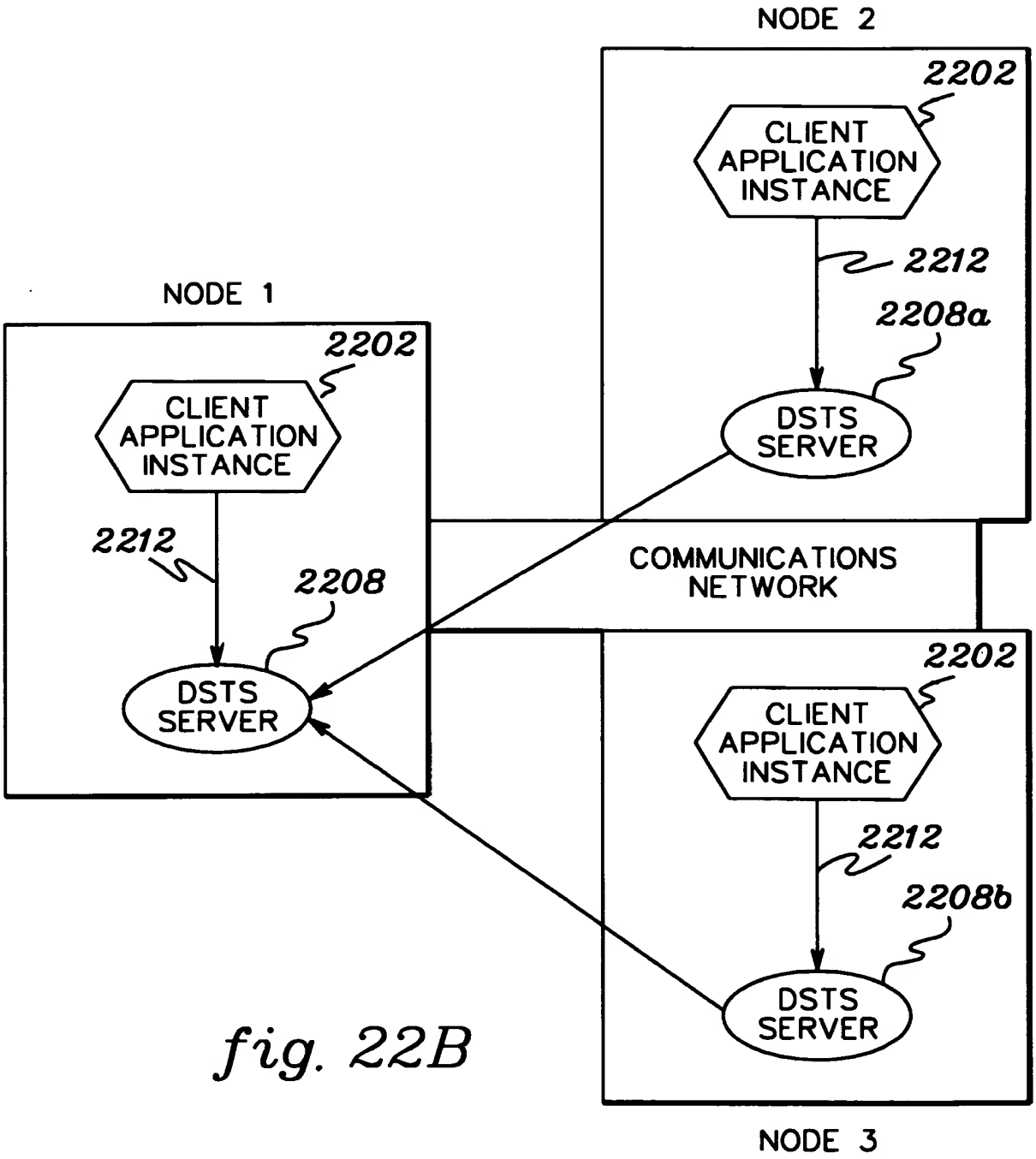
NODE 2
2202
CLIENT APPLICATION INSTANCE
2212
2208a
DSTS SERVER
NODE 1
2202
CLIENT APPLICATION INSTANCE
2212
2208
DSTS SERVER
COMMUNICATIONS NETWORK
2202
CLIENT APPLICATION INSTANCE
2212
2208b
DSTS SERVER
NODE 3

fig. 22B

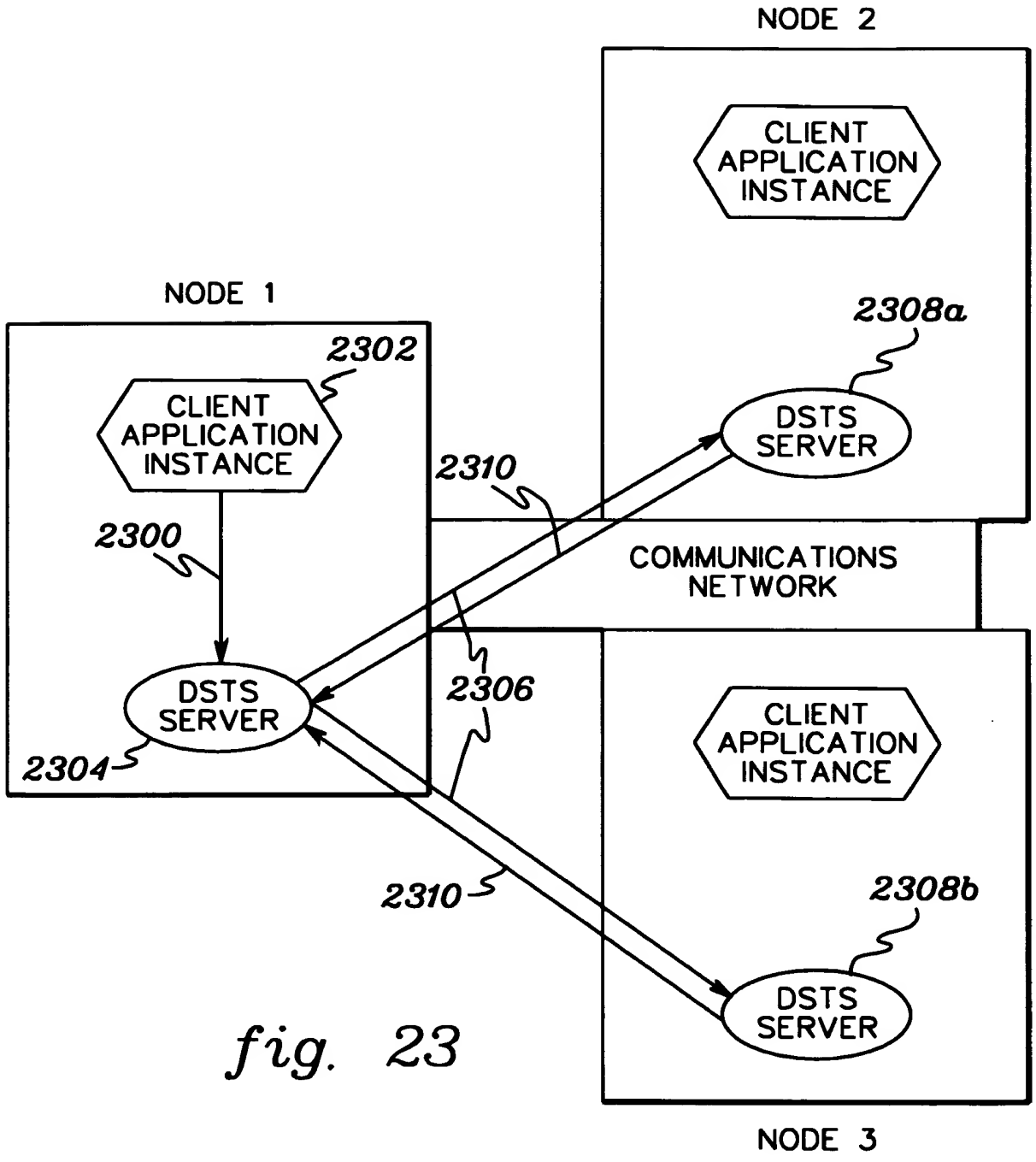
NODE 2
CLIENT APPLICATION INSTANCE
NODE 1
2308a
2302
CLIENT APPLICATION INSTANCE
DSTS SERVER
2310
2300
COMMUNICATIONS NETWORK
DSTS SERVER
2306
2304
CLIENT APPLICATION INSTANCE
2310
2308b
DSTS SERVER
NODE 3

fig. 23

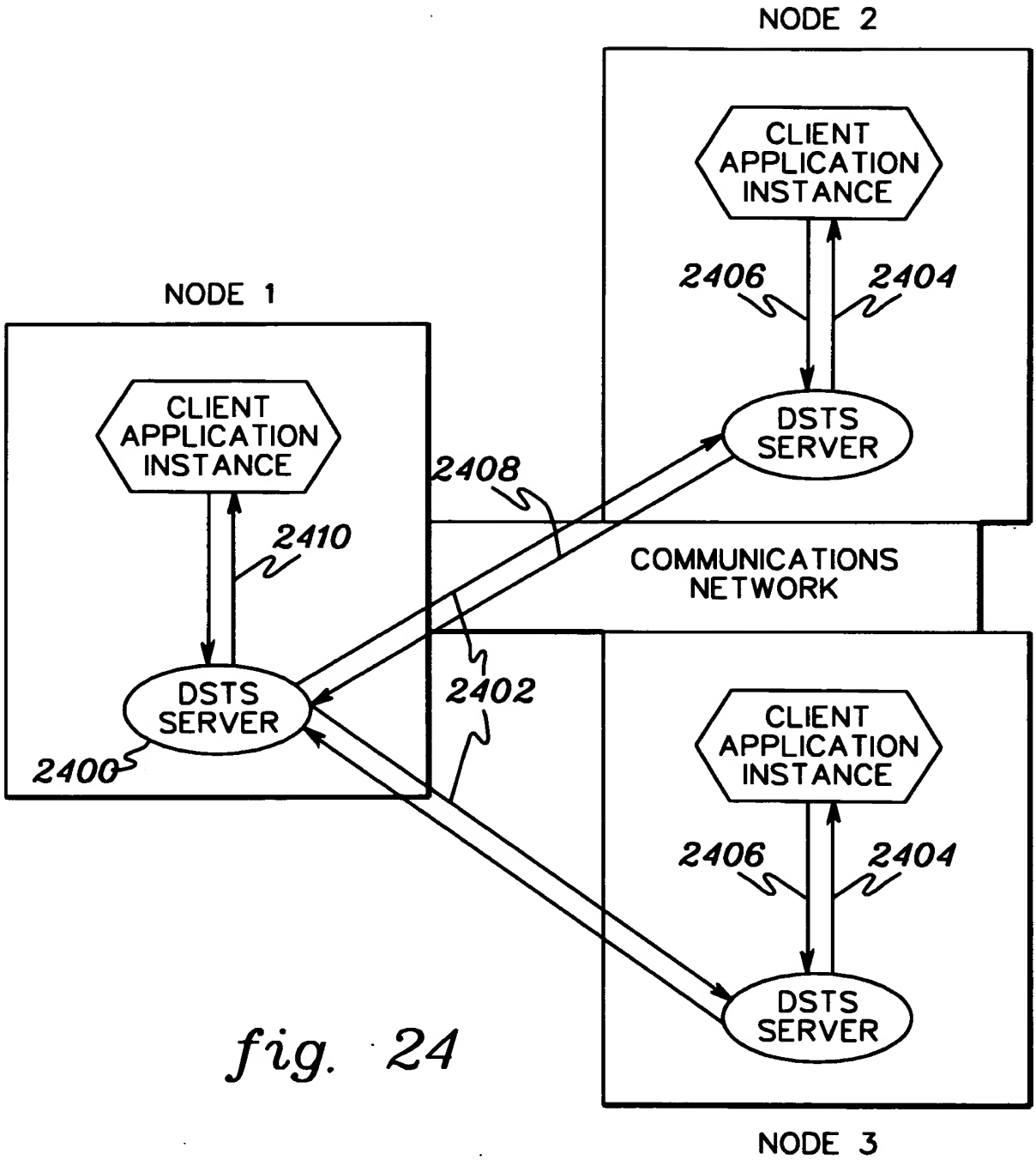
NODE 2
CLIENT APPLICATION INSTANCE
2406
2404
DSTS SERVER
NODE 1
CLIENT APPLICATION INSTANCE
2408
2410
COMMUNICATIONS NETWORK
DSTS SERVER
2402
2400
CLIENT APPLICATION INSTANCE
2406
2404
DSTS SERVER
NODE 3

fig. 24

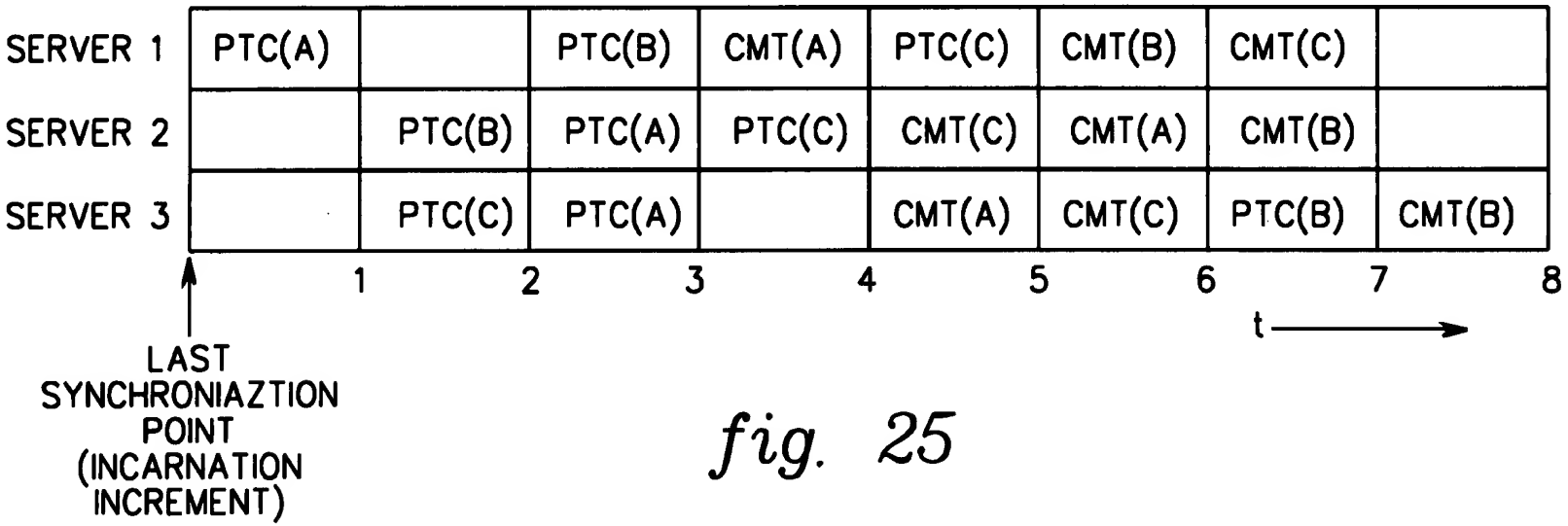
SERVER 1
PTC(A)
PTC(B)
CMT(A)
PTC(C)
CMT(B)
CMT(C)
SERVER 2
PTC(B)
PTC(A)
PTC(C)
CMT(C)
CMT(A)
CMT(B)
SERVER 3
PTC(C)
PTC(A)
CMT(A)
CMT(C)
PTC(B)
CMT(B)
1
2
3
4
5
6
7
8
t
LAST SYNCHRONIAZTION POINT (INCARNATION INCREMENT)

fig. 25

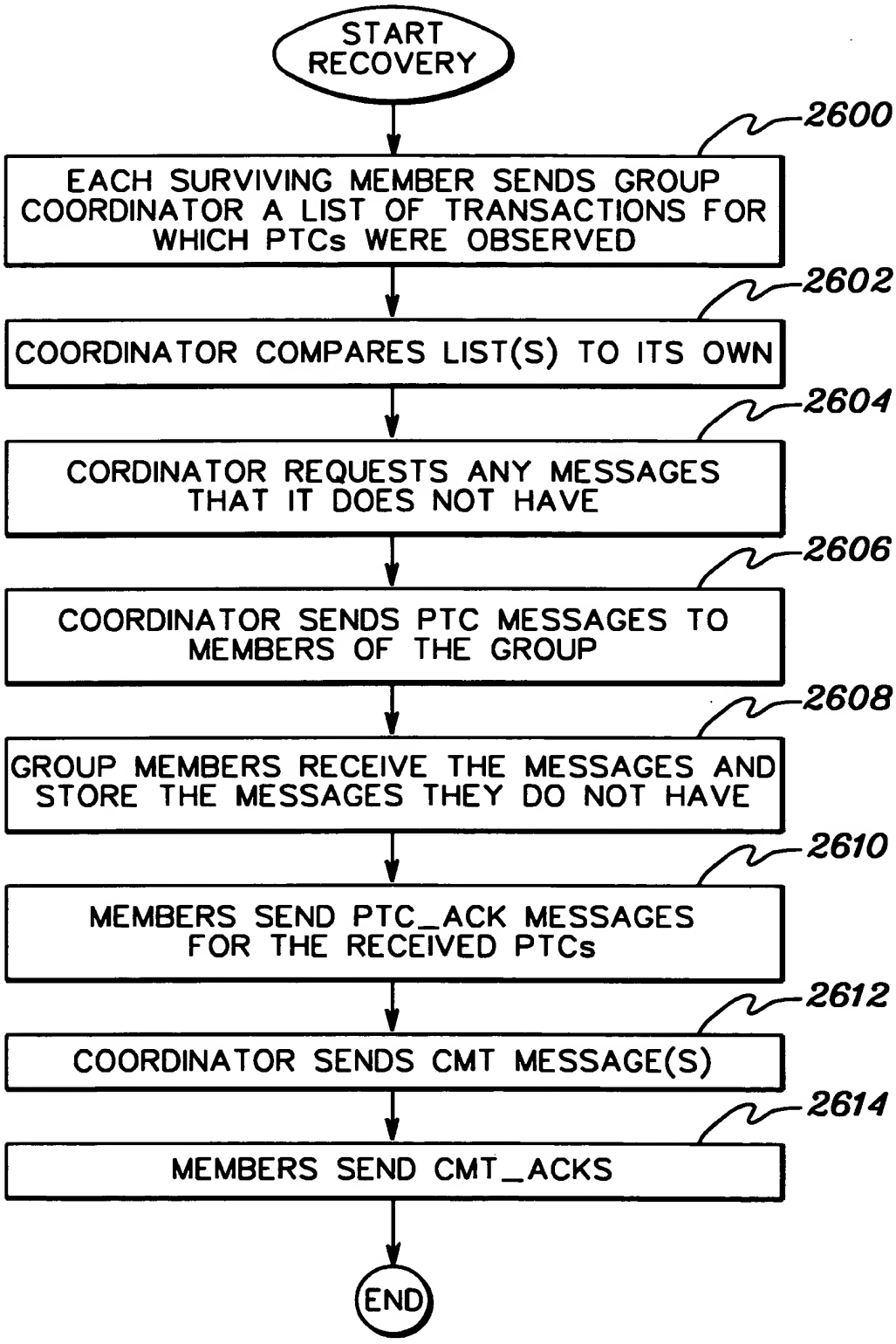
START RECOVERY
2600
EACH SURVIVING MEMBER SENDS GROUP COORDINATOR A LIST OF TRANSACTIONS FOR WHICH PTCs WERE OBSERVED
2602
COORDINATOR COMPARES LIST(S) TO ITS OWN
2604
CORDINATOR REQUESTS ANY MESSAGES THAT IT DOES NOT HAVE
2606
COORDINATOR SENDS PTC MESSAGES TO MEMBERS OF THE GROUP
2608
GROUP MEMBERS RECEIVE THE MESSAGES AND STORE THE MESSAGES THEY DO NOT HAVE
2610
MEMBERS SEND PTC_ACK MESSAGES FOR THE RECEIVED PTCs
2612
COORDINATOR SENDS CMT MESSAGE(S)
2614
MEMBERS SEND CMT_ACKS
END

fig. 26